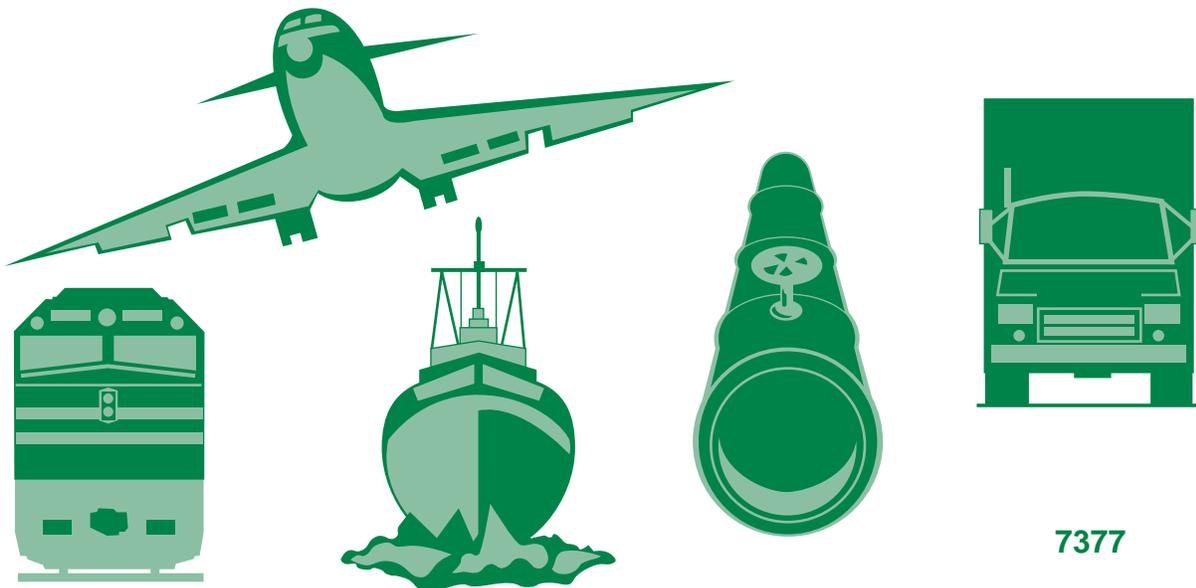


# NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

## MARINE ACCIDENT BRIEF REPORT

**FIRE ON BOARD THE NETHERLANDS-  
REGISTERED PASSENGER SHIP  
*NIEUW AMSTERDAM*  
GLACIER BAY, ALASKA  
MAY 23, 2000**



7377



# Marine Accident Brief Report

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**Fire On Board the Netherlands-  
Registered Passenger Ship**

*Nieuw Amsterdam*

**Glacier Bay, Alaska**

**May 23, 2000**

**NTSB/MBR-01/01  
PB2001-916402  
Notation 7377  
Adopted July 24, 2001**



**National Transportation Safety Board  
490 L'Enfant Plaza, S.W.  
Washington, D.C. 20594**

**National Transportation Safety Board. 2001. *Fire On Board the Netherlands-Registered Passenger Ship Nieuw Amsterdam, Glacier Bay, Alaska, May 23, 2000.* Marine Accident Brief Report NTSB/MBR-01/01. Washington, DC.**

**Abstract:** This report discusses the May 23, 2000, fire that occurred on the Netherlands-registered passenger ship Nieuw Amsterdam, while it was en route to Glacier National Park. None of 1,169 passengers and 542 crewmembers on board the vessel was killed or sustained serious injury; however, one passenger suffered smoke inhalation injuries requiring evacuation to a shoreside hospital for additional medical treatment. Damages related to the accident exceed \$360,000.

From its investigation of this accident, the National Transportation Safety Board identified safety issues in the following areas: the adequacy of shipboard training and drills in firefighting management for masters and other officers; the adequacy of Holland America's policies, procedures, training, and drills for limiting and controlling the spread of smoke during a fire; and the adequacy of Holland America's safety management oversight of shipboard firefighting operations. Based on its findings, the Safety Board made recommendations to the U.S. Coast Guard, Holland America Lines, Inc., American Classic Voyages, Carnival Corporation, Inc., Crystal Cruises, Disney Cruise Line, Norwegian Cruise Line, Orient Lines, P&O Princess Cruises International, Ltd., Radisson Seven Seas Cruises, Regal Cruises, Renaissance Cruises, Inc., Royal Olympic Cruises, Royal Caribbean Cruises, Ltd., and Silversea Cruises, Ltd

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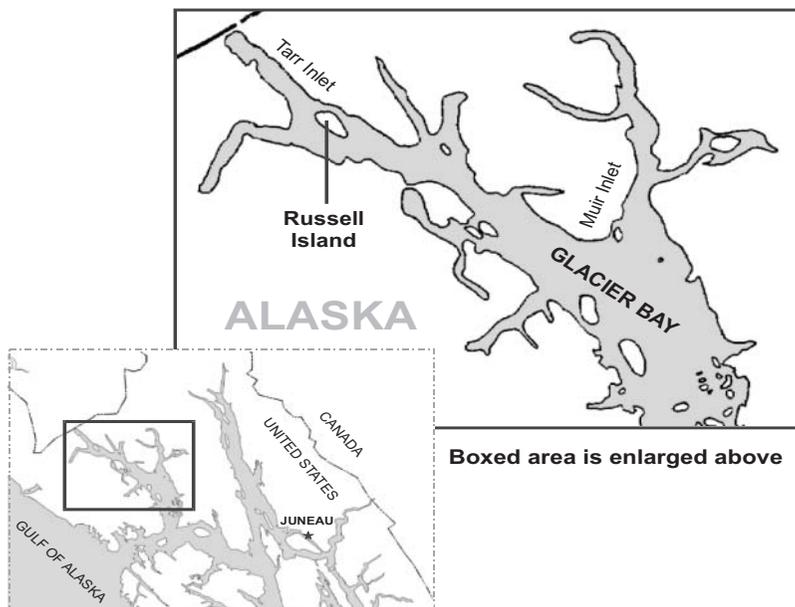


## Executive Summary

On the morning of May 23, 2000, while the Netherlands-registered passenger ship *Nieuw Amsterdam* was en route to Glacier National Park with 1,169 passengers and 542 crewmembers on board, a fire broke out in a crew cabin. A premature effort to extinguish the fire by officers lacking proper gear and backup contributed to the spread of fire and smoke. The fire did not spread beyond the deck of origin; however, the untimely closing of fire screen doors allowed the smoke to migrate up eight decks, creating hazardous conditions in crew and passenger accommodations. Properly outfitted and equipped shipboard firefighting teams subsequently extinguished the fire. One passenger sustained smoke inhalation injuries requiring evacuation to a shoreside hospital for additional medical treatment. Property damage to the vessel was estimated at more than \$360,000.

## Accident Description

On May 23, 2000, the Netherlands-registered passenger ship *Nieuw Amsterdam*, operated by Holland America Line Westours, Inc. (Holland America), was carrying 1,169 passengers and 542 crewmembers while en route to Glacier National Park as part of a 7-day cruise between Vancouver, British Columbia, and Seward, Alaska. (See figure 1.) At 0911, when the ship was about 5 miles north of Russell Island, in the Tarr Inlet, an alarm sounded on the bridge's fire detection system console, indicating that a smoke detector in a crew cabin on D deck had activated.



**Figure 1.** Approximate location of the *Nieuw Amsterdam* when the fire broke out.

At the time of the fire alarm, senior officers with emergency command and control responsibilities, as listed in Holland America's Safety Management System (SMS), were in various areas of the ship. The master, who had responsibility for the safety of the ship, was on the bridge. The chief officer, who had responsibility for directing firefighting command and control operations, was in his cabin, aft of the pilothouse. The safety officer, who had responsibility for the firefighting drills and training and the command of one of the two fire squads, was doing routine maintenance on D deck. The chief engineer, who had responsibility for ensuring the safe operation of the propulsion, steering, and other engineering systems, was in the engine control room. The second engineer, who was the commander of the second fire squad, as well as the operational backup for the chief engineer, was also in the engine room.

### ***Initial Response to Smoke Detector Alarm***

In addition to the master, the on-duty bridge crew included two deck officers, two quartermasters, a lookout, and an Alaska State-licensed pilot.<sup>1</sup> The on-duty third officer stated that when the alarm sounded, he followed company procedures and informed the master of a possible fire on D deck and ordered one of the quartermasters to investigate to ensure that it was not a false alarm. He advised the quartermaster to carry a full-face cartridge respirator (smoke mask), as well as a UHF radio so he could report his findings.

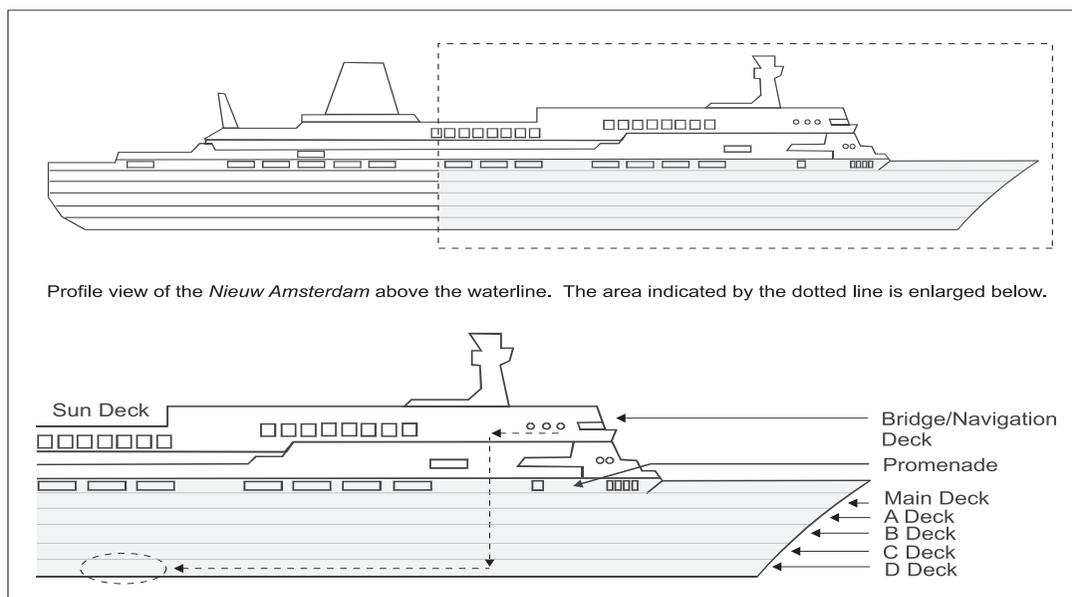
The quartermaster descended to D deck, eight decks below the navigation deck, and proceeded aft about 250 feet to the area where the smoke detector had activated. (See figure 2.) After passing fire screen door (FSD) D1, he observed smoke overhead and donned his smoke mask. (See figure 3.) Upon arriving at cabin D98, he saw smoke coming through the ventilation louvers in the lower section of the cabin door. He tried the door, but it was locked. He said that he immediately radioed a report of his observations to the third officer on the bridge, who, in turn, informed the master that smoke was coming from cabin D98.<sup>2</sup>

Based on the third officer's description of the quartermaster's account, the master called the chief officer, who was in his cabin on the navigation deck, and directed him to investigate the fire on D deck. The chief officer later stated that he knew that Holland America's SMS procedures stipulated that, in the event of a fire, he was to command firefighting operations from the bridge. However, at the direction of the master, he went to D deck to investigate the fire.

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<sup>1</sup> The pilot was a member of the Alaska Coastwise Pilots Association.

<sup>2</sup> Because of its date of construction, the *Nieuw Amsterdam* was not required by the *International Convention for the Safety of Life at Sea* (SOLAS) to have fire sprinklers in its crew and passenger accommodations areas.



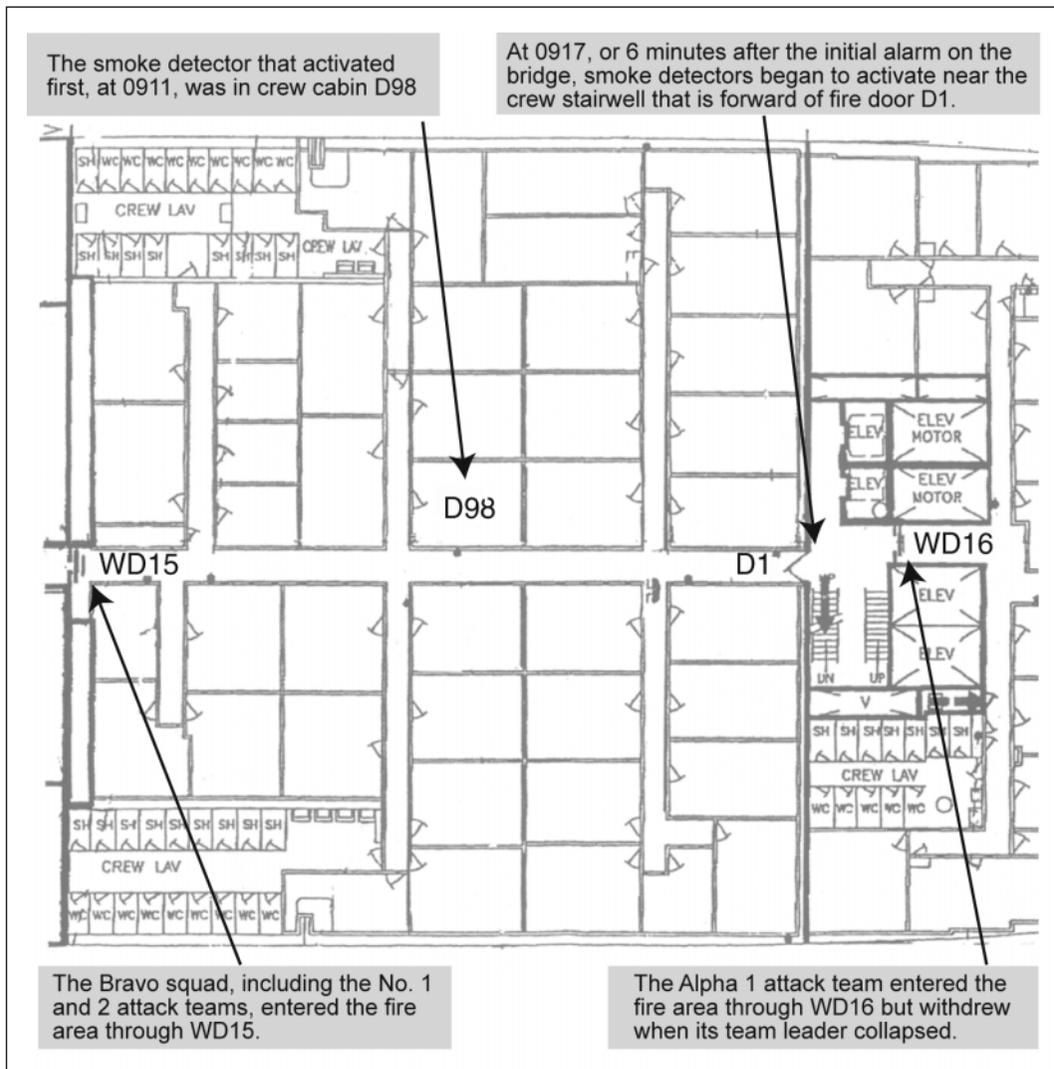
**Figure 2.** When the first alarm sounded on the fire detection system control panel, the third officer ordered a quartermaster who was on duty on the bridge to go to the affected area (indicated by the circle) to determine whether the alarm was false. The dotted line shows the route of the quartermaster from the bridge to cabin D98.

Meanwhile, the quartermaster on D deck started alerting off-duty crewmembers by yelling “fire” and “smoke” and by pounding on the cabin doors in the affected area.<sup>3</sup> He said that he met a crewman who had retrieved a dry chemical extinguisher from an adjacent passageway and a room steward who happened to have a passkey to cabin D98. The quartermaster opened the cabin door, and the crewman discharged the dry chemical extinguisher into the room. The quartermaster said that “a lot of smoke” came out of the cabin, whereupon he immediately closed the door to contain the smoke.

At this time, several officers were either on or entering nearby areas of D deck. The safety officer and another deck officer were doing routine maintenance on watertight door (WTD) WD19. An officer who had been recently assigned as a fourth officer<sup>4</sup> on the ship was walking through the area to join the other officers. In response to the smoke or to the quartermaster’s shouts of “fire,” the officers ran toward D98. The fourth officer arrived first and directed two crewmen to help her retrieve a fire hose. She said that as they were unrolling the hose, the safety officer arrived and ordered her to call the bridge and report the fire. At the direction of the bridge, the officers and crewmen then left the smoke-filled cabin area and reported to either a marshalling area or an emergency station.

<sup>3</sup> The *Nieuw Amsterdam* did not have locally sounding smoke alarms in the accommodations areas.

<sup>4</sup> The fourth officer is a junior deck officer on the ship.



**Figure 3.** Plan view of a portion of D deck. The fire started in cabin D98. Within 6 minutes of the initial smoke alarm activation at 0911, detectors began to activate near the crew stairwell forward of FSD D1.

Upon receiving the officer's report of the fire and learning that the crewmembers had not been successful in their firefighting efforts, the master, at 0919, ordered the general alarm sounded. The general alarm alerted passengers of the need to proceed to their muster stations and shipboard firefighting teams of the need to marshal at their assigned staging areas. The master did not radio the chief officer to return to his emergency station on the bridge. Instead, the master assumed the command and control of firefighting operations; the duties of this position required him to coordinate the onboard firefighting, control the spread of smoke and fire, handle the internal communications, and coordinate the evacuation of passengers and crewmembers. He was still responsible for performing his regular duties as master, as well as his own emergency command duties, which, in this case, included making announcements to the passengers, identifying and

navigating to a safe area to anchor, and handling the external communications with the U.S. Coast Guard (Coast Guard), shoreside emergency response agencies and Holland America's shoreside offices.

As the chief officer was descending from the navigation deck to the area of the fire, he said, he heard the general alarm and smelled smoke on C deck. He did not contact the bridge to confirm whether he should report to his emergency station or to tell the master that smoke had spread beyond D deck. When he reached D deck, he met the quartermaster in the stairwell, standing by FSD D1, which was slightly open. The chief officer grabbed and donned the quartermaster's smoke mask and instructed him to keep the door closed.

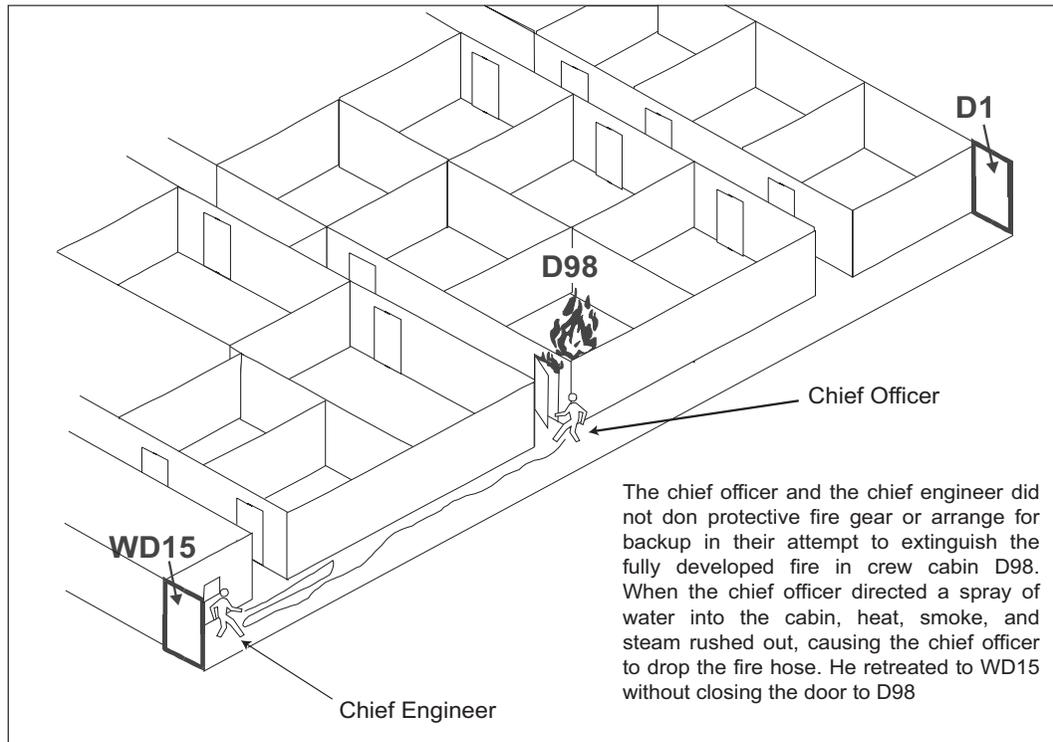
The chief officer said that when he entered the main passageway, he observed "a small amount of smoke." He then walked through the passageway and adjacent corridors, pounding on doors and yelling for people to evacuate. He said that while he walked along the passageway toward cabin D98, he could feel heat radiating from the cabin's inboard bulkhead. He then saw "thick, white smoke" streaming through the louvers of the D98 door and observed that a layer of smoke about 1 meter thick had filled the upper area of the passageway. He stated that he crouched beneath the layer of smoke and continued his sweep of the area, checking to ensure that no crewmembers were in their cabins. He said that as he approached WD15,<sup>5</sup> the WTD at the main vertical zone bulkhead, he found the door partially open and an uncharged fire hose on the deck.

The chief engineer was in the engine control room when the first 0911 alarm sounded indicating a smoke detector had activated in D98. When the general alarm sounded at 0919, he checked the operation of the fire pump and mustered engineering personnel. He said that he then left his emergency station to check the area of the activated smoke detector because he had noted on the fire detection system's repeater in the engine room that the detector was not far from the engine room. Once on D deck, he saw the chief officer near the partially open WD15. The chief engineer said that the chief officer told him to stand by a fire hydrant valve. The chief officer then picked up the uncharged hose and, crouching under the thickening layer of smoke, proceeded forward toward cabin D98. (See figure 4.) Neither of the men had fire protection gear, such as a self-contained breathing apparatus (SCBA), fire suit, gloves, or helmets. The only gear that the chief officer wore was the smoke mask that he had taken from the quartermaster.

After positioning himself near the closed door of D98, the chief officer shouted at the chief engineer to pressurize the hose line. The chief officer said that, while he stood in front of cabin D98, he could feel intense heat radiating from it, an indication that the fire was now fully developed. He partially opened the cabin door and could hear the fire, but could not see any flames. He bent down low to the deck and sprayed a straight stream of water into the cabin for about 30-40 seconds. He said that intense heat, white smoke, and steam came rushing out of the cabin door, forcing him back, whereupon he dropped the charged hose and retreated to WD15. He and the chief engineer then exited the area,

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<sup>5</sup> WD15 also serves as the FSD in this fire boundary.



**Figure 4.** The attempt to extinguish the fire by the chief officer and the chief engineer.

closing the WTD behind them. Although the chief officer could not remember whether he had closed the door to cabin D98, subsequent events showed that he had not.

### **Firefighting Efforts**

When the general alarm sounded, the ship's firefighting assets mobilized, which involved donning full fire protection gear at their assigned muster area. Holland America's emergency procedures for the *Nieuw Amsterdam* establish two onboard firefighting organizations, Alpha squad and Bravo squad. (See table 1.)

Each squad was to be composed of two attack teams. The Alpha squad was responsible for vessel spaces outside engineering, which included the crew accommodations areas, and the Bravo squad was responsible for the engineering spaces.

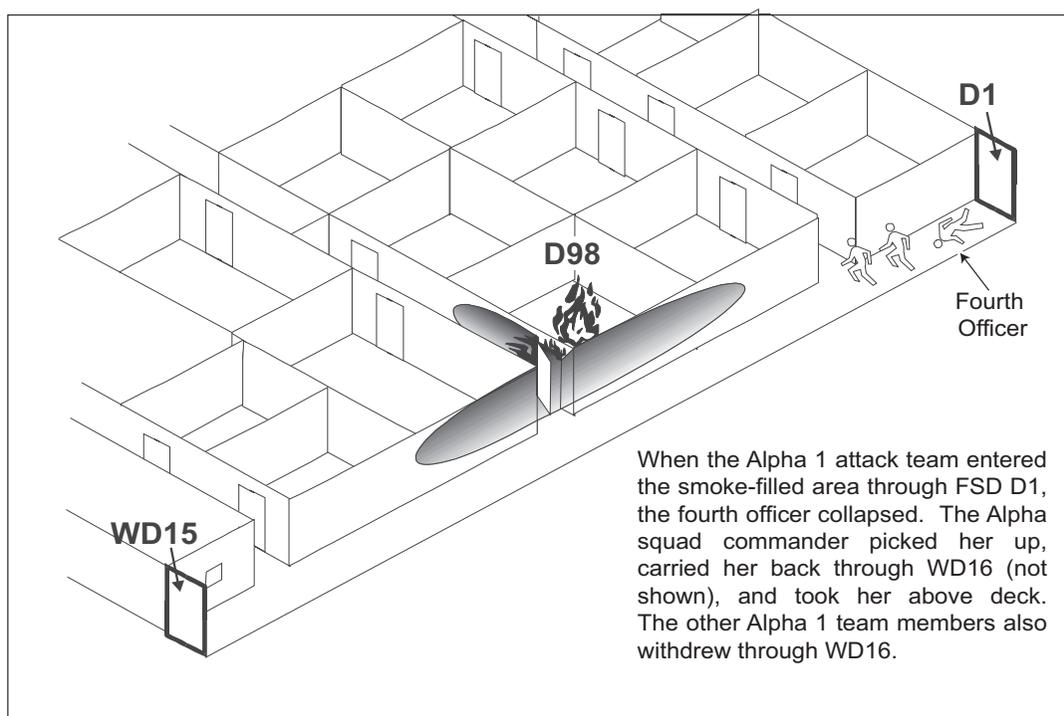
**Table 1.** *Nieuw Amsterdam's* Firefighting Assets<sup>a</sup>

	<b>Alpha Squad</b>	<b>Bravo Squad</b>
<b>Commander</b>	Senior Second Officer (Safety Officer)	Second Engineer
<b>Asst. Cmdr.</b>	Third Officer	Third Engineer
<b>Responsibility</b>	All vessel spaces outside engineering	Engineering spaces
<b>Squad Composition</b>	Two attack teams <ul style="list-style-type: none"> <li>• Alpha 1</li> <li>• Alpha 2</li> </ul> Hose preparation team Staging area team	Two attack teams <ul style="list-style-type: none"> <li>• Bravo 1</li> <li>• Bravo 2</li> </ul> Hose preparation team Staging area team
<b>Attack team composition</b>	Four members Deck officer Three unlicensed crewmembers <ul style="list-style-type: none"> <li>• Two attend the hose line</li> <li>• One serves as backup, assisting as needed with donning and hoses</li> </ul>	Four members Engineering officer Three unlicensed crewmembers <ul style="list-style-type: none"> <li>• Two attend the hose line</li> <li>• One serves as backup</li> </ul>
<b>Fire gear</b>	Team members who are for entry and attack are fully suited in fire turnout gear and SCBA. The squad commanders and the attack team commanders carry UHF radios.	

a. Personnel records indicate that all *Nieuw Amsterdam* personnel designated as having a command or support role in a fire emergency had attended firefighting training, as required by the *International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers*. All unlicensed personnel and deck officers had attended the basic firefighting course. In addition; all officers had attended the advanced firefighting course, which discusses principles of command and control. Typically, the recommended practice is for deck and engineering officers to direct the actions of the fire teams and not take a lead position in firefighting activities such as handling the fire hoses. The ship's log indicates that the *Nieuw Amsterdam* conducted periodic emergency fire drills, as required by *International Convention for the Safety of Life at Sea (SOLAS)*.

The bridge ordered the Alpha squad to position itself forward of WD16 in preparation for the assault on the fire. Only one of the two Alpha attack teams proceeded to the area of the fire. This unit, the Alpha 1 attack team, had three, rather than four, members and consisted of the fourth officer and two crewmen on the hose line. While the Alpha 1 attack unit proceeded to D deck, it was joined by the Alpha squad commander and assistant commander. On C deck, the group encountered smoke and donned SCBAs before continuing. Once the group members reached D deck, they rigged a hose line. The Alpha squad assistant commander then returned to C deck to turn off the electrical power to WD15 and WD16 so that the fire teams could open them. The Alpha squad commander and assistant commander both had UHF radios with which they could communicate with the bridge and with the Bravo squad.

In the meantime, the master ordered the Bravo squad to position an attack unit at WD15 and to backup the Alpha 1 team. The Bravo squad commander (the second engineer) chose to have the Bravo 1 attack team consist of himself, the assistant squad commander (the third engineer), and a day engineer. The third engineer had a UHF radio with which to communicate with the master and with the Alpha squad. The Bravo 1 attack team rigged a fire hose to extend from the boiler room toward WD15. While the team members were proceeding down from C deck, they met the chief officer and the chief engineer. The chief officer told the second engineer where the fire was and that a charged hose line was unrolled on the deck, forward of WD15. The chief engineer returned to his emergency station in the engine control room and the chief officer returned to the bridge to assume the command of the firefighting efforts from the master. The chief officer said that while he was en route to the navigation deck, he observed smoke on both C and B decks.

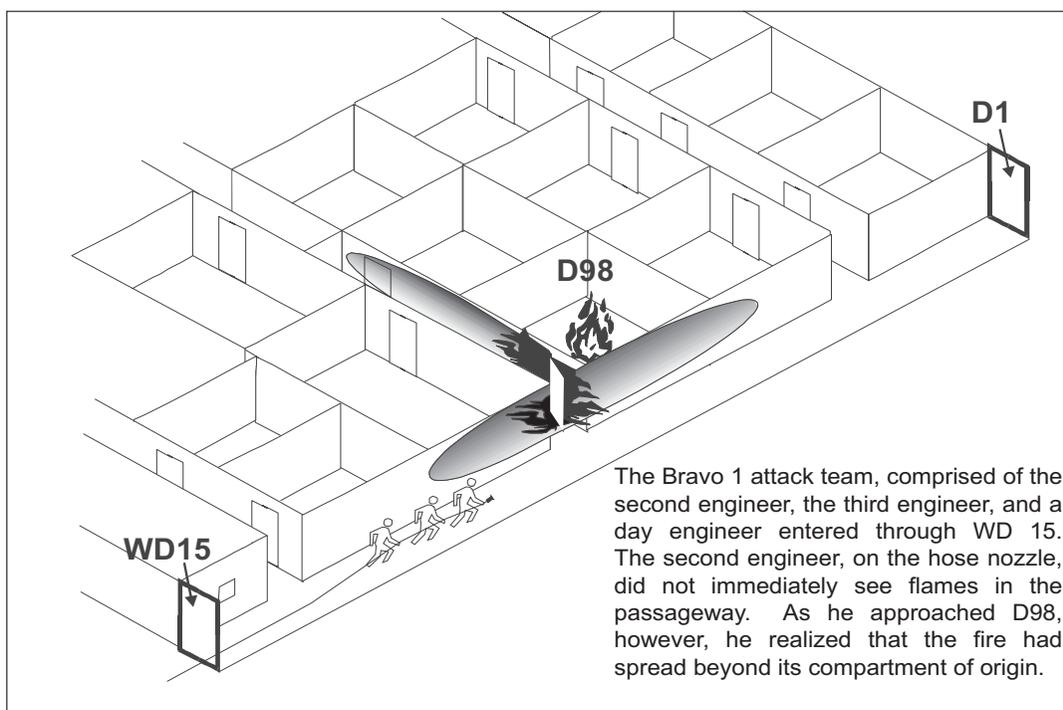


**Figure 5.** The Alpha 1 attack team's effort to fight the fire was abandoned when the team's leader, the fourth officer, collapsed.

About 0929, the Alpha 1 attack team and the Bravo 1 attack team both radioed the master that they were in position, forward of WD16 and aft of WD15, respectively. The master ordered the Alpha 1 team to attack the fire. The Alpha squad commander said that he opened WD16 and a lot of black smoke rushed out, reducing visibility to almost zero. The hose team advanced through FSD D1 into the passageway, giving shorts blasts of water to the overhead and bulkhead panels. (See figure 5.) The team leader (the fourth officer) followed the hose team. The squad commander indicated that because the team leader was new to the ship, he followed her to monitor her actions. When the attack team

members were a few feet into the passageway, the team leader collapsed,<sup>6</sup> and the squad commander picked her up and carried her back through WD16. The rest of the Alpha team followed, and they closed WD16 behind them. The squad commander then directed the squad assistant commander to take command of the hose team and stand by while he took the team leader to B deck. When the team leader appeared to be all right, the Alpha squad commander later returned to D deck.

At 0930, upon overhearing radio communications between the Alpha squad and the bridge, the Bravo 1 attack team radioed the bridge that it was entering the area through WD15. The second engineer said that he took the fire hose nozzle and led the attack. He had the day engineer serve as backup on the hose and the third engineer follow with a flashlight and a UHF radio. (See figure 6.)



**Figure 6.** Upon hearing that the Alpha 1 attack team had withdrawn, the backup unit, in this case the Bravo 1 attack team, entered the area to fight the fire.

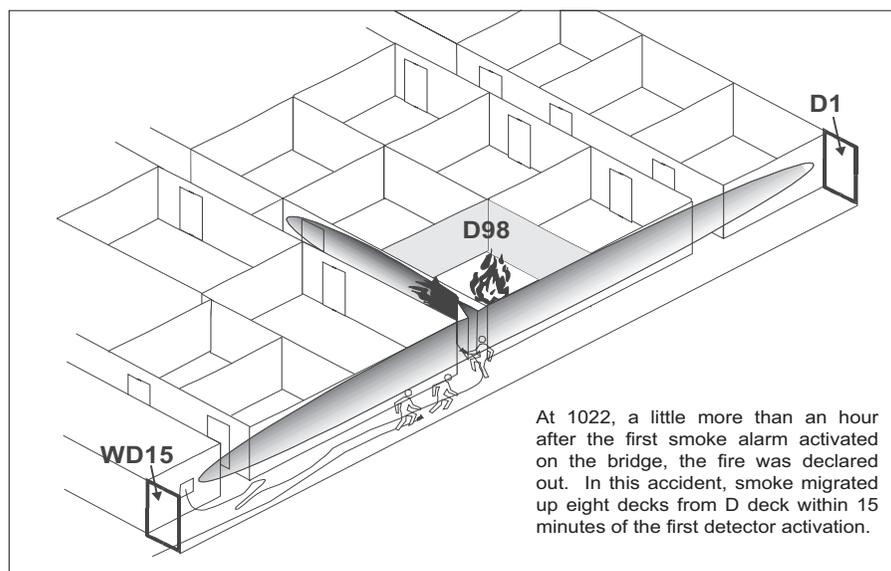
The Bravo 1 attack team members entered the passageway on their knees. The second engineer said that the main passageway was filled with thick black smoke but had a light draft of air moving through it. He said that when he sprayed the overhead, he saw burned paint hanging down but no flames. He did not see any flames in the passageway;

<sup>6</sup> The fourth officer later stated that she believed that she must have panicked and passed out.

however, he heard a noise in the area of the overhead, which he thought was the bubbling sound of paint burning.

As the Bravo 1 attack team approached cabin D98, the second engineer realized that the fire had progressed outside the cabin of origin. He said that he felt an increase in temperature and could see flames on the deck in the main passageway and in a portside corridor. He found the door to D98 open and saw flames inside the cabin. He said that, while approaching cabin D98, he was spraying water in the main and other passageways when he discovered that the hose line from the boiler room would reach no farther. He retrieved the charged hose line that the chief officer had abandoned and resumed spraying the decks and overheads. He then attacked the fire inside cabin D98. He said that after he sprayed water into the cabin for several minutes, the flames were no longer visible.

While the Bravo 1 attack team was fighting the cabin fire, the Bravo 2 attack team, carrying a second hose line from the boiler room, arrived at WD15 and began working its way forward toward FSD D1, spraying water on the fires in the passageways. A member of the Bravo 2 team relieved the day engineer, who then returned to the engine room to start the ventilation fans. When the low-pressure alarm sounded on the second engineer's air bottle, the third engineer relieved him. The hose teams continued spraying water until all flames were extinguished on D deck. Shortly before 1000, all ventilation was restored to evacuate the smoke and improve visibility, and the Alpha squad commander reported to the bridge that the fire was under control. The teams continued with overhaul operations and stood by for re-flash until about 1022, when the fire was declared out. (See figure 7.)



**Figure 7.** The gray area in this illustration shows the fire and smoke damage on D deck.

### **Actions on Bridge**

On the bridge, about the time when the quartermaster made his first report, the fire control panel began indicating that multiple smoke alarms had activated. Between 0911, when the first smoke detector activated, and 0919, when the master ordered the general alarm sounded, 15 smoke detectors activated on D deck. Of these, two detectors were in the crew staircase by FSD D1.

Upon receiving the report of a fire from the officer on D deck, the master made the following announcements<sup>7</sup> to the passengers and the crew, at 0920 and 0921, respectively:

Ladies and gentlemen, may I have your attention. This is your captain with an important announcement for all guests and crew. We just received a fire alarm on the D deck. We just received a fire alarm on D deck. Our fire squads are currently checking out the situation. Please cooperate closely with the officers and crew in following their instructions. There is no cause for alarm. We will keep you closely informed.

This is an announcement for crew. There has been a fire reported on the D deck aft; please evacuate the D deck; please evacuate the D deck. Fire squads report to your fire stations, medical teams report to the infirmary, lowering squads report to the bridge wings, passenger-assist team report to housekeeping office, traffic directors report to dining room forward.

At 0923, a smoke detector activated in a crew stairwell on C deck. About 0925, the master secured ventilation throughout the ship, closed the FSDs on D deck, and closed WD15 and WD16. He next ordered all elevators secured, the engine room placed on stand-by, and the emergency fire pump started.

At 0928, a smoke detector activated in a crew stairwell on B deck. Shortly after 0930, the master began receiving reports from crewmembers that smoke was spreading upward to decks C, B, and A. He conferred briefly with the Alaska State pilot on an appropriate location to anchor the vessel in the event that the fire adversely affected propulsion or steering. During this discussion, the pilot offered to call the Coast Guard while en route to the anchorage, and the master accepted his offer. The pilot, however, had problems contacting the Coast Guard because high mountains in the area interfered with the VHF radio transmissions. A staff officer offered to help the pilot and attempted to send a message via the ship's satellite communication system; however, the staff officer was not familiar with the equipment because operating it was not one of his duties. He inadvertently sent a message with a distress priority without the master's knowledge or approval.<sup>8</sup> Another Holland America vessel in the area received the message and radioed both the company's shoreside office and the Coast Guard with news of the fire. At 1015, the Coast Guard radioed the *Nieuw Amsterdam* to determine the status of the fire.

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<sup>7</sup> Taken from transcripts of recordings provided by Holland America

<sup>8</sup> As a result of this incident, Holland America now requires that certain staff officers become qualified in operating the ship's satellite communication system.

At 0932, the fire detection panel indicated that a smoke alarm had activated in a crew staircase on the main deck. At this time, about 20 minutes after the first smoke alarm, the master began broadcasting announcements to clear some of the affected areas. After ordering the low-location lighting turned on, he announced that all passengers on C deck should move to a higher deck and that passenger-assist teams should check that all cabins on C deck had been evacuated. The master then instructed the cruise director to assume responsibility for making the evacuation announcements. By this time, the fire detection panel indicated that a smoke detector had activated at 0936 in a crew stairwell on the promenade deck. Shortly thereafter, about 25 minutes after the first smoke alarm, the chief officer returned to the bridge and assumed the command of firefighting operations from the master.

At 0941, or a half hour after the first alarm, the cruise director announced that all passengers and crewmembers should move from C deck, B deck, A deck, and the main deck to a higher-level deck. He then ordered the ship's rescue squad to ensure that decks B and A had been evacuated. Shortly after 0947, at the master's instructions, the cruise director announced that all passengers should move from inside the vessel to an outside deck. He also directed passenger-assist teams and evacuation teams to check and, if necessary, move anyone from the interior areas of the decks to an outside deck.<sup>9</sup>

### ***Passenger Muster***

According to shipboard personnel, when the general alarm sounded at 0919, most passengers were either on the promenade deck (deck No. 7) or the sun deck (deck No. 10), where they were observing the glaciers and listening to a commentary being given by a ranger from the National Park Service. Some passengers were in their cabins, and "a small number of passengers" were eating breakfast in the restaurant on the lido deck.

Shipboard personnel said that, at the sounding of the general alarm, most passengers listening to the commentary on the upper decks proceeded to their muster stations, as directed in the practice drill held when the ship departed Vancouver.<sup>10</sup> Also, most passengers who were in their cabins retrieved their lifejackets and proceeded directly to their stations. Some passengers returned to their cabins to retrieve their lifejackets. One couple in the lido deck restaurant first finished their breakfast and then went to their cabin, which was on B deck, to retrieve their lifejackets, medicine, and valuables. They said that they also wanted to obtain warm clothing for the outside air. The couple said that when they reached B deck, they observed the passageway was "a little smoky." They estimated that they stayed in their cabin about 6-7 minutes.

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<sup>9</sup> In postaccident interviews, the master stated that his primary concern during the emergency was to move passengers outside and away from any smoke.

<sup>10</sup> The *Nieuw Amsterdam* had conducted an emergency drill, which is required by SOLAS, shortly after the ship left Vancouver. According to Holland America officials, during the drill, passengers had been told that, if they heard the general alarm, they should retrieve their lifejackets and proceed to their muster stations. They also had been told that, if they were not in their cabins, they should proceed immediately to their muster areas and that lifejackets would be provided to them.

Meanwhile, at the muster stations, crewmembers took roll of the assembled passengers, as required by Holland America's SMS, and informed the master that passengers from a cabin on B deck and a cabin on main deck could not be accounted for. The master then ordered evacuation teams with SCBAs to check the two cabins and decks for the missing people.

About this time, the two passengers who had returned to their cabin on B deck exited their room and encountered thick smoke that severely reduced visibility. The woman put her jacket over her face and moved aft along the passageway. She said that her husband told her to get down near the deck. He followed her and shouted for help. She said that as she neared a doorway and stairs, a crewmember grabbed her and led her to the crew mess hall and then to the promenade deck. She then advised the crewmembers that her husband was still on B deck.

According to the husband, when he crouched to move along the deck, he became disoriented. He thought that he might have passed some exit doors (FSDs that were closed) and that he might have blacked out at one point. He said that a crewmember grabbed him and helped him up the stairs first to the crew mess hall and then to the promenade deck to rejoin his wife. A shipboard medical team examined the couple to determine the scope of their injuries. They were later evacuated by medical helicopter to a hospital in Juneau, where the husband was admitted for treatment of injuries.<sup>11</sup>

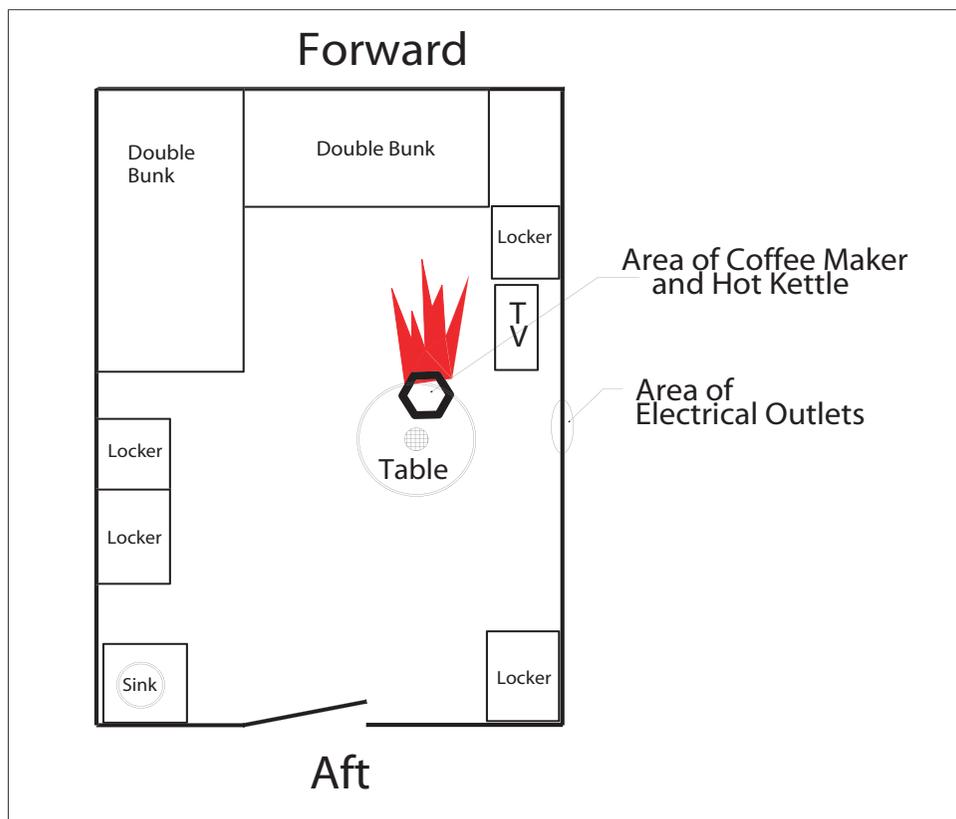
About 1100, after the fire had been declared out, the passengers were moved inside to the lounges and public spaces, which had been ventilated and cleared of smoke. About an hour later, after all cabins on the lower decks had been checked, the passengers were allowed to return to their rooms. The *Nieuw Amsterdam* weighed anchor and continued with the cruise. However, when the bridge requested medical evacuation for the injured couple who had been stranded on B deck, the Coast Guard asked the *Nieuw Amsterdam* to proceed south. The ship subsequently received a Coast Guard Captain of the Port (COTP) order to anchor in Bartlett Cove for a Coast Guard inspection. After officials from the Alaska State Fire Marshal's Office and the Coast Guard inspected the ship, Marine Safety Office-Juneau issued a COTP order granting permission for the ship to resume its voyage.

On May 25, when the *Nieuw Amsterdam* arrived in Seward, investigators from the Safety Board and the U.S. Treasury Department's Bureau of Alcohol, Tobacco, and Firearms (ATF) boarded the vessel. Investigators interviewed the four crewmembers who had occupied cabin D98. One crewmember stated that he had returned to his cabin to have a cup of tea and had plugged in a coffee maker to heat the water when he was called back to work. He said that he had switched off the coffee maker but had not unplugged it. He recalled that all other electrical appliances were turned off.

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<sup>11</sup> As a result of the investigations of the *Nieuw Amsterdam* fire and two prior fires on passenger ships, the Safety Board issued recommendations regarding the installation of locally sounding smoke alarms to 18 cruise ship lines in July 2000. The text of the safety recommendation letters is on the Web at <<http://www.nts.gov>>

The ATF conducted a systematic examination of cabin D98 to determine the origin and cause of the fire.<sup>12</sup> Investigators observed burn patterns on the cabin bulkheads and furnishings, indicating that the greatest heat and flame damage came from a point near a small round table in the middle of the room, near the starboard bulkhead. (See figure 8.) In examining the debris in this area, investigators found the remains of a coffeemaker and a hot water kettle (electric). The ATF's examination of the coffeemaker showed damage indicative of heating and melting from the exterior to the interior of the appliance. The coffeemaker's internal heating element and associated electrical components were undamaged. The remnants of the hot water kettle heating element showed metal distortion indicative of internal heat damage that extended from the inside to the outside of the appliance. Investigators eliminated other possible sources of ignition, including any other electrical source and smoking materials, in this cabin area and concluded that the hot water kettle was the source of the fire.



**Figure 8.** Plan view of crew cabin D98.

<sup>12</sup> For further information, read: Department of the Treasury, Bureau of Alcohol, Tobacco and Firearms *Report of Investigation on the Nieuw Amsterdam Ship Fire*, Case No. 787010-00-0070 (Washington, DC: ATF 2000).

According to the ship's safety officer, Holland America has had a long-standing policy prohibiting cooking and water heating appliances in crew berthing areas. As a result of the *Nieuw Amsterdam* fire and a fire on another Holland America ship, the company issued a fleet advisory stating that any crewmember found to be cooking or in possession of a cooking appliance in a crew cabin would be immediately terminated. The advisory also stipulated that the masters of all vessels were required to have weekly inspections, as well as unannounced, periodic random searches, of crew cabins to check for cooking appliances.

## Safety Issues

In its analysis of the *Nieuw Amsterdam* accident, the Safety Board identified the following safety issues: the adequacy of shipboard training and drills in firefighting management for masters and other officers; the adequacy of Holland America's policies, procedures, training, and drills for limiting and controlling the spread of smoke during a fire; and the adequacy of Holland America's safety management oversight of shipboard firefighting operations.

Company files indicate that all *Nieuw Amsterdam* officers and crewmembers having a command or support role in a fire emergency, including the principals in this accident, had attended firefighting training, as required by the *International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers*. The unlicensed crewmembers had taken basic firefighting training, and the officers had taken basic and advanced firefighting training. Holland America's SMS, together with the *Nieuw Amsterdam's* station bill, established the shipboard organization and specified the responsibilities of personnel during a fire emergency. Further, the vessel had conducted the periodic crew fire drills required by SOLAS 74, as amended.

Despite having received proper training and having performed frequent drills, several key individuals, in particular, officers with command responsibilities during a fire, did not follow accepted marine firefighting protocol and company shipboard procedures during the actual emergency. When the fire on board the *Nieuw Amsterdam* was detected, the fire was contained within cabin D98. Had several officers handled the emergency differently, the fire might never have escaped from the confines of the cabin. Additionally, the spread of smoke might have been curtailed, which would have reduced the risk of injuries to passengers and crewmembers.

Some crewmembers followed Holland America's procedures during the emergency. When the smoke alarm activated, the third officer in the pilothouse immediately notified the master and dispatched one of the duty quartermasters to investigate whether the alarm was false. The third officer advised the quartermaster to carry a UHF radio and a smoke mask. The third officer's actions were both timely and appropriate for the circumstances and indicated that he knew how to respond to the situation. The communication and personal protective equipment that the quartermaster carried was adequate to reconnoiter the general area of the fire. The bridge officers,

however, did not provide the quartermaster with a passkey that would have enabled him to gain access to the cabin.

When the quartermaster arrived on D deck and entered the passageway leading toward cabin D98, he observed a light amount of smoke. He donned his smoke mask, a prudent response to the conditions. At the door of cabin D98, he saw smoke issuing from the ventilation louvers. He tried the door but found it locked, whereupon he immediately radioed a report of his observations to the third officer on the bridge. The quartermaster's actions, therefore, provided the timely notification that should have enabled officers having command responsibilities during fire emergencies to marshal shipboard firefighters and systematically deal with the fire and smoke.

The quartermaster then correctly attempted to clear personnel from the affected area by shouting "fire" and pounding on the cabin doors to alert crewmembers of the need to exit D deck. Only happenstance enabled the quartermaster to determine the scope of the fire. His shouts alerted a cabin steward who happened to have a passkey and unlocked the door of cabin D98. The quartermaster teamed with another crewman who had retrieved a dry chemical extinguisher. After the men determined that it was safe to open the door, they did so and discharged the extinguisher into the room. When a large volume of smoke began to escape through the open doorway, they promptly closed the door. The quartermaster radioed the bridge to report that he had not been able to extinguish the fire. The actions of the quartermaster and the crewman were appropriate. Upon encountering conditions that were not imminently dangerous, they tried to extinguish the fire; however, upon finding the fire beyond their ability to extinguish, they immediately closed the door, which contained the fire and most of the smoke.

The breakdown in the systematic handling of the emergency began with the master's initial response on the bridge. When the third officer told the master of the quartermaster's account of the smoke, the master's first action was to violate his own shipboard fire plan. He ordered the chief officer to go to the fire scene to investigate the report instead of having him immediately report to the bridge, his assigned duty station in the event of a fire. As the person in charge of the command and control of shipboard firefighting operations, the chief officer belonged on the bridge, where he had access to communications equipment, vessel plans, fire detection and suppression systems, and remote controls for the ventilation systems, FSDs, and WTDs. From this central location, he could receive reports from the fire squads on scene, assess the situation, and plan the proper course of action. The master assumed the chief officer's responsibilities, as well as his own, which included the safe navigation of the ship, the internal and external communications, and the overall management of the shipboard emergency to ensure the safety of the passengers and crewmembers.

Holland America's shipboard emergency procedures were based on the assumption that the existence of a fire would be verified before the ship's firefighting assets were mobilized. In this case, the quartermaster had been appropriately tasked with this responsibility. However, despite the quartermaster's providing an early confirmation of the fire and follow-up calls advising the bridge on the status of the fire, the master did not immediately react. He did not sound the general alarm signaling the fire teams to

marshal or broadcast a message alerting crewmembers on D deck to evacuate their accommodations until he received a call several minutes later from an officer who happened to be on D deck.

While the master was trying to juggle his own responsibilities and those of first officer, additional crucial actions were not executed in a timely manner. The master lost some degree of control over external communications and did not ensure that the Coast Guard was contacted in a timely manner. Indeed, about an hour elapsed after the first smoke alarm sounded before the Coast Guard received a relayed distress message from another Holland American vessel and responded to the *Nieuw Amsterdam* emergency. If the fire on the ship had been beyond the capabilities of the shipboard firefighters, the delay in contacting the Coast Guard and arranging for additional resources could have had tragic consequences.

Inefficient management contributed to the spread of smoke beyond the area of the fire and increased the risk of injury to passengers and crewmembers. Following the quartermaster's report of the fire, the master continually received alarms indicating worsening smoke conditions, yet he did not immediately order the progressive clearing of the decks by the crew, the closing of FSDs as the smoke migrated to other decks, and the ventilation secured in any area of the ship. Any of these actions could have dramatically curtailed the spread of smoke throughout the *Nieuw Amsterdam*.

The master's orders to secure certain areas were interspersed among his alerts to passengers, communications with the fire squads, and other tasks, the result being that decks were secured after, rather than before, they filled with smoke. For example, between the time that the master alerted passengers to the fire (0920) and the time that he began fielding communications from the fire attack squads (0929), smoke detectors had activated in the crew staircase near FSD D1 on C deck and B deck, at 0923 and 0928, respectively. Yet, the master did not order passenger-assist teams to begin evacuating decks and securing the areas until after the smoke had reached the main deck, at 0932, more than 20 minutes after the initial alarm, at 0911.

If the chief officer had been on the bridge performing his command and control duties, he or the master could have reviewed the printout from the fire detection panel and determined that the crew staircase by FSD D1 was acting like a chimney, funneling smoke to the upper decks. The printout, however, was not used to document and plan deck closings. In addition, passenger-assist teams were not ordered into position at the fire doors in a timely manner nor were they used as monitors to report on the effectiveness of the deck clearing and door closings.

The number of concurrent tasks that the master was trying to perform probably adversely affected his ability to control the spread of smoke. If, however, Holland America, and, in this case, the *Nieuw Amsterdam*, had had a systematic plan or specific procedures for controlling the spread of smoke, the evacuation of the decks and the appropriate management of door closings might have been achieved. Timely door closings could have significantly limited, if not eliminated, the spread of smoke to other decks and the consequent injury of a passenger whose cabin was two decks above the fire. At the

very least, established shipboard procedures for controlling smoke would have enabled the officers to monitor and manage smoke control measures.

Smoke control problems were not limited to the bridge. Some crewmembers did not recognize the importance of promptly reporting smoke. For example, the chief officer, during his descent to D deck, failed to alert the bridge that he smelled smoke on C deck. Such information might have assisted the master in directing smoke control activities. The Safety Board notes that the ship's log indicates that the *Nieuw Amsterdam* conducted periodic fire drills as required by SOLAS and that Coast Guard reports indicate that shipboard personnel had performed satisfactorily during a fire drill that was conducted as part of the Coast Guard's last quarterly examination.<sup>13</sup>

The focus during fire drills, however, is typically on firefighting. To maximize safety on a passenger ship, procedures for managing the evacuation of passengers and crew and for managing the control of smoke need to be established. For example, crewmembers need to be trained to immediately report any progression of smoke, to rapidly evacuate any passengers and crew from smoke-threatened areas, and to close FSDs to prevent the migration of smoke any farther. Officers, too, need to be trained to take proactive measures to prevent the migration of smoke and to direct the clearing of decks where passengers and crewmembers might be located. Officers should be able to use the fire control plan so that they can anticipate where smoke might migrate. They should interactively coordinate with crewmembers to clear the decks and close FSDs. They should be able to activate or shut down ventilation as appropriate. Follow-up drills should be devised and practiced to feature different scenarios that test the abilities of the officers and crew to respond to different smoke conditions. The Safety Board, therefore, believes that Holland America should revise shipboard procedures for controlling smoke to incorporate proactive measures that ensure the rapid clearing of passengers and crew from decks and that prevent the migration of smoke. Further, Holland America needs to devise and practice drills that feature different scenarios that test the abilities of officers and crew to respond to varying smoke conditions.

During the early stages of the fire, the chief officer and the chief engineer essentially abandoned their command roles, choosing to make a premature attack on the fire without obtaining proper gear and arranging for backup. Their inappropriate actions directly contributed to the spread of fire and smoke.

While en route to D deck, the chief officer heard the general alarm, an indication for the fire squads to marshal and don their gear. The Safety Board realizes that the chief officer was directed by the master to investigate the fire. Given the chief officer's command position and duties in shipboard firefighting, however, he should have been alerted by the general alarm to radio the bridge and verify whether he should return to the bridge or continue to D deck to assess the fire. When the chief officer reached C deck and encountered smoke, he failed to alert the bridge to the worsening conditions and to the need to secure the ventilation and the FSDs in the affected areas. He also did not ensure that WD15 and WD16 were secured to prevent the migration of smoke.

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<sup>13</sup> The examination was conducted on May 21, 2000.

At FSD D1, the chief officer met the quartermaster, donned the latter's smoke mask, and proceeded toward cabin D98. While he walked toward cabin D98, the chief officer encountered clear indications that the fire in the area was now fully developed. Heat was radiating from the cabin's inboard bulkhead, and thick, white smoke streaming through the louvers of cabin D98's door had filled the upper half of the passageway. He then met the chief engineer who had left his emergency station in the engine control room to check out the area where the smoke alarm had sounded. Neither man had protective fire gear. They decided to fight the fire without obtaining proper clothing and equipment or arranging for a backup hose team. When the chief officer sprayed water into the cabin, intense heat, white smoke, and steam came rushing out of the cabin door, driving him back and causing him to drop the hose. He retreated and rejoined the chief engineer, leaving the door to cabin D98 ajar, which allowed the fire and smoke to escape its compartment of origin and spread to the adjoining passageways. The chief officer and the chief engineer then exited the area to return to the bridge and the engineroom, their respective emergency stations.

While the chief officer and the chief engineer were making their unsupported and precipitate attack on the fire, some of the ship's firefighting personnel had marshaled in a timely manner and taken up positions forward and aft of the affected area. In fact, after his abortive attempt to fight the fire, the chief officer met the Bravo 1 attack team members near WD15 as they were descending from C deck.

Some firefighting personnel handled the firefighting effectively, albeit not in accordance with the ship's station bill. The performance of the ship's Bravo squad members in attacking the fire demonstrated that they were trained and properly equipped to extinguish the fire. They used proper technique in approaching the fire, backed one another up during the evolution of the fire, and maintained effective radio communications with each other and with the bridge. Their efforts resulted in the fire being extinguished in short order, with no injury to any of the firefighters. Had the chief officer and the chief engineer not acted precipitately during the early stages of the fire and left the door to cabin D98 ajar, the regularly constituted and properly outfitted fire teams would probably have extinguished the fire inside the cabin, and it might not have spread to the adjoining passageways. The chief officer and the chief engineer took actions that compromised the effectiveness of the ship's firefighting capability, needlessly endangered themselves, and risked the safety of the passengers and crew.

The Safety Board is concerned that the chief officer, the chief engineer, and the firefighting squad officers elected to serve as firefighters in this accident. The Board recognizes that the chief officer and the chief engineer probably were motivated by the desire to extinguish the fire as quickly as possible; however, their actions were ill advised and actually made the situation worse, rather than better. Had either one of these two officers been injured in their firefighting effort, the ship would have lost the benefit of his knowledge and expertise during the emergency.

The same is true for the officers on the Bravo squad. Despite the fact that the Bravo teams performed well and ultimately extinguished the fire quickly, the Safety Board is concerned about the officers' assuming forward attack positions without having

replacements in their command and control positions. The Safety Board recognizes that shipboard managers should have the discretion to organize the fire teams as they see fit. Fire squad and fire team leaders should be able to use their firefighting assets where and how the fire and smoke warrant. In this accident, however, if the officers saw the need to personally attack the blaze, they should have arranged to have command and control replacements, i.e., an acting squad commander and an acting assistant squad commander. In particular, the squad leaders' alignment in the attack order potentially jeopardized any effort at effective command and control. By virtue of their regular shipboard assignments, junior officers and unlicensed crewmembers lack the authority to order a senior officer out of a potentially dangerous situation. If the second engineer and the third engineer had been seriously injured or overcome by smoke, the handling of the emergency might have been adversely affected.

The Safety Board is somewhat reluctant to find fault with the actions of the Bravo squad leaders because their attack teams were not intended to be the primary firefighters in this accident. The Alpha squad, which was responsible for all ship areas other than engineering, was first ordered to attack the fire. The management and the composition of the Alpha unit, however, were not adequate for the emergency. The squad commander, who was also the safety officer for the ship, did not position two attack teams. The attack team that led the initial assault on the fire had an inexperienced leader. When she panicked and fainted, the squad leader did not have the necessary people in position to handle the setback. After he carried her out of the smoke-filled passageway, he chose to take her above deck, thus removing himself from his command and control position. He should have directed another person to attend to her and remained with the Alpha 1 team. Instead, he left the management of the attack team to his second in command (the third officer); however, the Alpha squad assistant commander did not have an officer to lead the attack team or other resources adequate to safely continue the firefighting. The Alpha unit, therefore, had to abandon its role as the primary firefighting unit.

The *Nieuw Amsterdam* held regular fire drills in accordance with regulatory requirements. While the training may have prepared the shipboard personnel to attack a fire, the drills apparently did not adequately prepare some officers to appropriately assess and manage a fire emergency.

The Safety Board considers it essential to the safe operation of ships that masters and officers be able to fulfill their proper command and control functions during shipboard fires. The Safety Board, therefore, believes that Holland America should revise shipboard training and drills for its masters and other officers to include emphasis on their management responsibilities during a fire emergency and the principles of command and control of onboard firefighting activities.

The *International Management Code for the Safe Operation of Ships and for Pollution Prevention*<sup>14</sup> requires that shipping companies conduct periodic internal and external audits, i.e., management oversight, to ensure the continued adequacy of their safety programs and to identify nonconformities that must be corrected to improve safety. Shoreside management should be aware of whether shipboard activities during an emergency are being conducted in accordance with the company's written policies,

procedures, and other directives, such as station bills. Only days before this accident, the company conducted a fire training drill aboard the *Nieuw Amsterdam* in which company officials evaluated the shipboard response as being in accordance with their policies, procedures, and directives. During a real-life situation, however, the ship's officers seriously deviated from procedures. In particular, two senior officers attempted to fight a fire without protective equipment or gear and failed to secure a smoke-filled area, thus permitting smoke to travel upward through multiple decks. Because its most recent oversight review did not reveal deficiencies that could, in another emergency, seriously affect the safety of passengers, crew, and its ship, Holland America needs to reexamine its process for evaluating how its shipboard management team fights fires and controls smoke. The Safety Board, therefore, believes that Holland America should review and revise, as necessary, its safety oversight procedures for assessing the effectiveness of its training and drills for firefighting command and control and the effectiveness of its procedures for controlling the spread of smoke during a shipboard fire.

About a month before the *Nieuw Amsterdam* accident, Holland America had a crew cabin fire on another company vessel. During the postaccident examination of the crew quarters following that fire, company officials found not only that some crewmembers had been using prohibited cooking appliances in their cabins, but also that some individuals had tampered with the cabin's smoke detectors so that they would not activate. Following the *Nieuw Amsterdam* fire, on May 25, 2000, the company issued a fleet advisory stating that any crewmember found to be cooking or in possession of a cooking appliance in a crew cabin would be immediately terminated. Further, any crewmember found to have tampered with a smoke detector would be immediately terminated. The advisory also stipulated that the masters of all vessels were required to have weekly inspections as well as unannounced, periodic random searches of crew cabins to check for cooking appliances and disabled smoke detectors. The Safety Board considers the actions taken by Holland America to be appropriate.

The events of the *Nieuw Amsterdam* accident, in particular, the poor handling of the fire and smoke, the breakdown in firefighting command and control, and the inadequate control of the crewmembers' use of prohibited electrical appliances offer lessons that, in the Safety Board's opinion, might benefit other passenger ship companies. The Safety Board believes that the cruise line companies, including their subsidiary operating cruise lines, should review the circumstances of the May 23, 2000, fire on board the Netherlands-registered passenger ship *Nieuw Amsterdam*, in particular, the unauthorized use of electrical appliances by the crew and the company's smoke control management policies and procedures. Based on their review, the companies should make changes, as appropriate, to improve fire safety on their ships

The Safety Board is aware that the International Maritime Organization's Maritime Safety Committee has established a working group to consider safety on large passenger

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<sup>14</sup> In 1994, the IMO adopted the ISM Code that, among other requirements, stipulated that ship-operating companies establish an SMS that sets forth procedures for conducting normal shipboard operations, as well as procedures for responding to potential shipboard emergencies, including fires. The ISM Code became effective for passenger ships on July 1, 1998.

ships. The working group is considering safety on existing and future large passenger ship from a global perspective, that is, from an overall systems-safety approach. In reviewing large passenger ship safety issues, the working group is also considering matters related to the human element, such as operations, management, and training. The Safety Board believes that the Coast Guard should submit the lessons learned from the *Nieuw Amsterdam*'s accident, in particular the need for proper firefighting management and the need to control the spread of smoke, to the IMO working group for its consideration.

## Probable Cause

The National Transportation Safety Board determines that the probable cause of the fire on board the *Nieuw Amsterdam* was the unauthorized use of an electrical appliance that had been left unattended and plugged into an electrical outlet in a crew cabin. Contributing to the extent of the fire damage and spread of smoke was a breakdown in firefighting command and control by the vessel's master and senior officers.

## Recommendations

As a result of its investigation of this accident, the National Transportation Safety Board makes the following recommendations:

### To the U.S. Coast Guard:

1. Submit the lessons learned from the National Transportation Safety Board's investigation of the *Nieuw Amsterdam* accident, in particular, the need for proper firefighting management and the need to control the spread of smoke to the International Maritime Organization's Working Group on Large Passenger Ship Safety for their consideration.

### To Holland America Lines, Inc.:

2. Revise shipboard training and drills for your masters and other officers to include emphasis on their management responsibilities during a fire emergency and the principles of command and control of onboard firefighting activities.
3. Revise shipboard procedures for controlling smoke to incorporate proactive measures that ensure the rapid clearing of passengers and crew from decks and that prevent the migration of smoke.
4. Devise and practice drills that feature different scenarios that test the abilities of officers and crew to respond to varying smoke conditions.

5. Review and revise, as necessary, your safety oversight procedures for assessing the effectiveness of your training and drills for firefighting command and control and the effectiveness of your procedures for controlling the spread of smoke during a shipboard fire.

**To American Classic Voyages, Carnival Corporation, Inc., Crystal Cruises, Disney Cruise Line, Norwegian Cruise Line, Orient Lines, P&O Princess Cruises International, Ltd., Radisson Seven Seas Cruises, Regal Cruises, Renaissance Cruises, Inc., Royal Olympic Cruises, Royal Caribbean Cruises, Ltd., and Silversea Cruises, Ltd.:**

6. Review the circumstances of the May 23, 2000, fire on board the Netherlands-registered passenger ship *Nieuw Amsterdam*, in particular, the unauthorized use of electrical appliances by the crew and the company's smoke control management policies and procedures. Based on your review, make changes, as appropriate, to improve fire safety on your ships.

## **BY THE NATIONAL TRANSPORTATION SAFETY BOARD**

**CAROL J. CARMODY**  
Acting Chairman

**JOHN A. HAMMERSCHMIDT**  
Member

**JOHN J. GOGLIA**  
Member

**GEORGE W. BLACK, JR.**  
Member

**Adopted: July 24, 2001**